REMARKS

Applicants respectfully request reconsideration of this application in view of the foregoing amendments to the claims and the following comments.

In the Office Action mailed June 4, 2003, claims 1-12 and 31-35 were rejected under 35 U.S.C. § 103(a), as alleged obvious over U.S. Patent No. 4,873,029 to Blum (the "Blum patent") in view of U.S. Patent No. 6,127,505 to Slagel (the "Slagel patent"), either by itself or further in view of U.S. Patent No. 6,113,811 to Kausch et al. (the "Kausch patent"). Further, claims 1 and 36-38 were rejected under 35 U.S.C. § 103(a), as allegedly obvious over U.S. Patent No. 5,827,614 to Bhalakia et al. (the "Bhalakia patent") in view of the Slagel patent. Applicants respectfully traverse these rejections.

Telephone Interview

Before addressing the issues raised in the Office Action, Applicants would like to thank the Examiner for her courtesy in granting a telephone interview on August 29, 2003, with one of the named inventors, Nancy Yamasaki, and Applicants' undersigned attorney of record. During the telephone interview, the Examiner articulated her position that structural features needed to be added to the claims, to more clearly exclude coverage over polarized parts incorporating polarizers that are not heat-damaged or that are displaced from their prescribed positions on an optical construct. The existing claim terms "optical quality" and "integrally bonded" were deemed inadequate to provide such an exclusion.

In response, Applicants have by this Amendment amended independent claim 1 to address the concerns of the Examiner. These amendments, and the distinctions of the claimed invention from the cited references, are discussed below.

The Rejection of Claims 1, 3, 5-12, and 31-35 Under 35 U.S.C. § 103(a) Based on the Blum and Slagel Patents

In rejecting independent claim 1 based on the combination of the Blum patent and the Slagel patent, the Examiner asserted that the Blum patent discloses all of the features of claim 1, but "does not disclose an optical construct comprising a high impact polyurethane-based

optical material." Nevertheless, the Examiner asserted that the Slagel patent makes up for this deficiency by disclosing an optically clear high impact polyurethane-based optical material, and further asserted that it would have been obvious to one having ordinary skill in the art to have used Slagel's material to make Blum's optical construct. The stated motivation for making this substitution would have been to provide impact resistance.

Applicants respectfully disagree. Substituting a high impact polyurethane-based optical material for Blum's CR-39 material (allyl diglycol carbonate) is *not* a straightforward task. No showing has been made that those having ordinary skill in the art would have been able to make an optical-quality polarized part incorporating an optical construct of such a material, integrally bonded to a polarizer.

As discussed at length in the Background of the Invention section of the application, the inventors were, in fact, motivated to improve the impact resistance of optical lenses like those disclosed in the cited Blum patent, by substituting a high-impact, polyurethane-based material for CR-39 as the optical construct. However, initial efforts to make such a modified optical lens led to significant problems. These efforts were summarized as follows:

> **[0009]** "... In early attempts to combine their modified high impact polymeric material [i.e., modified polyurethane-based material of the Slagel patent] with standard polyvinyl alcohol (PVA) polarized film using conventional techniques, the film was consistently displaced and bent out of shape during the introduction of the material. Thus, initial testing revealed that a substitution of their high impact material for standard lens thermoset resin materials and conventional manufacturing processes was not possible.
>
> **[0010]** "Analysis of the initial testing further revealed that the properties of their modified high impact polymeric material greatly contributed to the inventors' failure to incorporate it into an improved optical-quality, polarized plastic part. Briefly, casting of polarized lenses and other eyewear requires controlled and reproducible positioning of the film or supported polarizer within the solidifying polymer. Gasket designs and certain conventional filling techniques typically help to control the positioning of the film during standard

lens casting. It is not uncommon to spend 10 to 15 seconds filling the assembly with resin to ensure even flow and controlled distribution of the resin around the polarizer layer. However, their modified high impact polymeric material solidifies more quickly than standard thermoset resins (approximately 30 seconds rather than several hours). Thus, standard PVA polarized film was consistently displaced and bent out of shape during the introduction of the material due, at least in part, to the quick setting time of the material.

[0011] "In a similar manner, the polarization or other essential physical properties of standard polarizing film can be compromised by the heat of the polymer's solidification process or by reaction with the monomers of the pre-mix. The modified high impact polymeric material creates considerable heat within the mold assembly during its normal, exothermic curing process. This can soften the polarizer or supporting layers, causing further displacement of the polarizing film. Depending on the polarizers or polarizing materials used, this heat could also change the color or decrease the efficiency of a polarizer. Organic dyes used as polarizers would be especially susceptible to this type of damage.

[0012] "Thus, the inventors recognized that existing manufacturing processes suggested that high impact polyurethane-based material could not be used to effect an optical-quality plastic part due to the fundamental difficulty of handling the fast-reacting modified high impact polymeric material, in combination with the more demanding process of reproducibly positioning a polarizer within any optical construct, while maintaining the optical and mechanical performance of the part . . ."

See, Applicants' specification, page 4, line 8, – page 5, line 20.

Thus, the simple substitution of the high-impact polyurethane-based material of the Slagel patent for the CR-39 material of the lens substrate of the Blum patent would lead to two significant problems: (1) displacement of the polarizer within the mold; and (2) heat damage to the polarizer due to the rapid polymerization reaction. No reference has been cited by the Examiner teaching how these problems could be overcome.

Another reason why the Examiner is wrong in asserting it would have been obvious to have substituted a high-impact polyurethane-based material for the CR-39 material of the lens substrate of the Blum patent relates to the requirement for an integral bond between the lens substrate and the polarizing wafer. In Blum's lens assembly, the lens substrate and the adjacent surface of the polarizing wafer both are formed of the same CR-39 material. This similarity of materials greatly facilitates an integral bonding of the polarizing wafer to the lens substrate. Substituting a high impact polyurethane-based material for the CR-39 material of Blum's lens substrate, however, would cause the lens substrate and the adjacent surface of the polarizing wafer to be chemically quite dissimilar. Because of this dissimilarity, persons skilled in the art would not have expected an integral bond between the two components to have been achievable.

These problems all would have been immediately apparent to those of ordinary skill in the art. Such persons, therefore, would have known that the normal approaches used for thermoset materials, *e.g.*, the approaches outlined in the Blum patent, would have likely failed when applied to a high-impact polyurethane material. Consequently, they would have been dissuaded from even attempting to integrally bond a polarizer to a high-impact polyurethane-based optical material. There are several reasons for this likely failure.

First, the fast curing time of the polymeric material would make it extremely difficult to control the flow of material over and/or around the polarizer. The fast curing time also would require such a rapid introduction of the polyurethane material as to physically displace the polarizer from its prescribed, optically designed position within the assembly. Such problems would have severe adverse effects on the assembly's optical quality, specifically, distortion and aberration, which are two important attributes of optical-quality parts identified in the Background of the Invention section of the application.

Second, the solidification reaction of the polyurethane system was known to be an exothermic reaction, as discussed in the Background of the Invention section of the application. Those of ordinary skill in the art, and experienced with polarized lenses and in particular with PVA polarizers that are normally used in this industry, would have recognized that the heat-sensitive PVA film would very likely be irreparably damaged by the exothermic reaction,

resulting in loss of polarizing efficiency. Because polarizing efficiency is a key attribute of a polarizing optical part, this immediately would have signaled a serious concern.

Third, high-impact polyurethane materials fall firmly in the gray area between thermosets and thermoplastics. Thermosets are characterized by requiring heat to react and solidify, but decomposing or compromising their physical and chemical properties upon excessive exposure to heat. Thermoplastics, on the other hand, are characterized by melting rather than decomposing upon heating, and then solidifying upon cooling back into a stable form. Thermoplastics typically are more cross-linked in their polymeric structure than are thermosets, and such cross-linking can improve their structural integrity and impact resistance. A simple analogy for thermosets is an egg: once heated, it cannot return to its original form; more heating simply burns the new solid matrix. In contrast, thermoplastics are analogous to wax: it can be remelted and reformed many times without damage.

The high-impact polyurethane systems described in the application may be heated to accelerate their reaction, but considerable leeway in reaction temperature is indicated, as mentioned in the paragraphs 0050-0054 of the application. In addition, excess heat will thermally damage the polyurethane and cause unacceptable yellowing of the resulting optical product, as discussed in paragraphs 0029, 0030 and 0050 of the application. Thus, in some ways, polyurethanes resemble a thermoset material. However, the polyurethane systems also generate considerable heat in the reaction process, which is not necessarily typical of thermoset reactions. In addition, as disclosed in U.S. Patent No. 5,962,617 (discussed in paragraphs 0005, 0006, and 0029 of the application), additives to increase structural integrity and encourage cross-linking may be included in the polyurethane system, which will increase its resemblance to thermoplastic behaviors. Thus the polyurethane material is considered to function somewhat intermediate the thermoset and thermoplastic classes of materials.

It, therefore, will be appreciated that a polarized production process that has been optimized for the cooler temperatures associated with thermosets cannot tolerate the higher temperature, sudden exotherm, and quick solidification of the polyurethane material. Thus, for one of ordinary skill in the art, merely substituting the polyurethane material for thermoset materials would not be an obvious solution to creation of a polyurethane polarized part.

The above argument parallels the argument that was previously presented, in an Amendment filed December 5, 2002. In section 5 of the Office Action mailed June 4, 2003, the Examiner dismissed this argument by asserting, in essence, that even if displacement of the polarizer and heat damage to the polarizer were to occur, the claim rejection nevertheless is proper because "the claim is not limited to a product without these deficits."

Applicants respectfully disagree with the Examiner assertion that the claims are not limited to a product without these deficits. First, the claims call for an optical-quality polarized part, in which a polarizer is *integrally bonded* to an optical construct. Such a part would not likely be provided if the polarizer were displaced or if it were heat damaged.

Nevertheless, in the interest of advancing prosecution of this application, Applicants have now amended independent claim 1 to define the polarizer to have "a first side and an opposing second side," and, further, to be integrally bonded to the optical construct "across the entire bonding surface thereof, in a prescribed place thereon." This should clarify the claim's limitation to polarized parts that are "optical-quality" and to polarized parts having polarizers "integrally bonded" to a high-impact polyurethane-based optical construct, "across the entire bonding surface thereof, and in a prescribed place thereon." Polarized parts incorporating polarizers that are displaced or heat damaged, are excluded.

Also in section 5 of the Office Action, the Examiner mischaracterized Applicants' arguments by suggesting that Applicants have acknowledged that the combination of the Blum and Slagel patents would have obvious, but that such combination would be inoperative. This is not what Applicants argued. What they argued was that persons of ordinary skill in the art would have understood the inherent difficulty of integrally bonding a polarizer to a high-impact polyurethane-based optical material and thus would have been motivated to not even attempt to accomplish the bonding.

The Examiner cited two reported opinions as supporting her arguments. However, neither case is at all relevant to our situation. *Beckman Instruments v. LKB Produkter AB*, 892 F.2d 1547, 1551, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989) was cited for its statement "[e]ven if a reference discloses an inoperative device, it is prior art for all that it teaches," and *Symbol Techs. Inc. v. Opticon Inc.*, 935 F.2d 1569, 1578, 19 USPQ2d 1241, 1247 (Fed. Cir.

1991) was cited for its statement "a non-enabling reference may qualify as prior art for the purpose of determining obviousness under 35 U.S.C. 103." In contrast, the Examiner in this case has not cited any reference teaching "an inoperative device." Instead, we have merely the Examiner's assertion that it would have been obvious to have combined the teachings of two *separate* references, and Applicants' have responded by arguing that those of ordinary skill in the art would have immediately understood the apparent incompatibility of the two references and, therefore, would *not* have attempted such a combination. This is not the same as a single reference disclosing an inoperative device.

Also in section 5 of the Office Action, the Examiner asserted that Applicants had "failed to establish any evidence to purported problems or deficiencies in the previous attempts to combine the teaching of the reference . . ." In response, Applicants point out that they have not submitted any such evidence because there is no evidence of any such "previous attempts to combine the teaching of the reference[s?]." Applicants should *not* be required to submit any such evidence, because there's no evidence that others previously had attempted to combine the teachings of Blum and Slagel. After all, it was the Examiner, not a prior reference, who suggested making the combination.

For these reasons, the rejection of independent claim 1 under 35 U.S.C. § 103(a), based on the combination of the Blum patent and the Slagel patent, is improper and should be withdrawn.

Claims 3, 5-12, and 31-35 all depend from amended independent claim 1 and define the invention with even greater particularity. Specifically, claim 3 defines the polarizer to comprise a wafer, claim 5 defines the optical construct to be a lens substrate, claims 6-10 define the nature of the high impact polyurethane-based optical material, and claim 11-12 define the polarized part to further include a hard coating integrally bonded either to the optical construct (claim 11) or to the polarizer (claim 12). The cited Blum and Slagel patents, together, fail to teach those having ordinary skill in the art how to make an optical-quality polarized part as defined in parent claim 1 and further incorporating the features defined in dependent claims 3, 5-12 and 31-35. Accordingly, the rejection of claims 3 and 5-12 under 35 U.S.C. § 103(a) is improper and should be withdrawn.

Claims 32-35, likewise, all depend from amended independent claim 1 and define the invention with even greater particularity, Specifically, claim 32 defines the polarizer to include first and second sides, with both sides bonded to the optical construct, claim 33 defines the polarizer to be bonded to the optical construct after the optical construct has been formed, claim 34 defines the optical construct to have opposing front and rear surfaces, with the polarizer bonded to the optical construct at or near the front surface, and claim 35 defines the polarizer to be treated for bonding to the optical construct. The cited Blum and Slagel patents, together, fail to teach those having ordinary skill in the art how to make an optical-quality polarized part as defined in parent claim 1 and further incorporating the features defined in dependent claims 31-35. Accordingly, the rejection of claims 31-35 under 35 U.S.C. § 103(a) is improper and should be withdrawn.

The Rejection of Claims 2 and 4 Under 35 U.S.C. § 103(a) Based on the Blum, Slagel, and Kausch Patents

In section 3 of the Office Action, claims 2 and 4 were rejected under 35 U.S.C. § 103(a), as allegedly obvious over the Blum patent in view of the Slagel patent and the Kausch patent. Claims 2 and 4 both depend from independent claim 1 and more particularly define the polarizer to comprise "a polyethylene terephthalate [PET] film" (claim 2) or "at least one layer supporting a polyvinyl alcohol [PVA] film" (claim 4).

The Kausch patent fails to make up for the deficiencies of the Blum and Slagel patents, discussed above in connection with independent claim 1. Specifically, the Kausch patent fails to teach that combining a polyvinyl alcohol film with layers that may contain PET would improve this bonding. In addition, as discussed above, the sensitivity of polyvinyl alcohol films to temperature might be expected by one of ordinary skill to make this combination even more intolerant of the exothermic polyurethane reaction.

Accordingly, the Blum, Slagel, and Kausch patents, together, fail to teach those having ordinary skill in the art how to make an optical-quality polarized part incorporating a PET or PVA polarizer integrally bonded to an optical construct formed of a high impact polyurethane-based optical material. Accordingly, the rejection of claims 2 and 4 under 35 U.S.C. § 103(a) is improper and should be withdrawn.

The Rejection of Claims 1 and 36-38 Under 35 U.S.C. § 103(a) Based on the Bhalakia and Slagel Patents

In section 4 of the Office Action, independent claim 1 and its dependent claims 36-38 were rejected under 35 U.S.C. § 103(a), as allegedly obvious over the Bhalakia patent in view of the Slagel patent. Independent claim 1 has been discussed above, and dependent claims 36-38 depend from claim 1 and more particularly define the nature of the polarizer. Specifically, claims 36 and 37 define the polarizer to comprise a wafer having a thickness of less than 1 mm (claim 36) or less than 0.2 mm (claim 37), and claim 38 defines the polarizer to comprise a material selected from the group consisting of polycarbonate, poly(methyl methacrylate), polystyrene, cellulose acetate butyrate (CAB), cellulose acetate, and cellulose triacetate.

As discussed above, the high-impact polyurethane material recited in parent claim 1 is differentiable from thermoplastic materials such as those discussed in detail in the Bhalakia patent. A system that depends on the higher temperatures of a thermoplastic melting process to integrally bond a polarizer in place by fusing or melting the materials together may not reach a sufficient temperature for integral bonding during a polyurethane cure. The Bhalakia patent, at col. 4, lines 49-53, and in greater detail at col. 18, lines 60-67, describes an approach to create an integral bond, namely, using the elevated temperature of the injected resin to fuse with their functional portion (which may contain a polarizer). Common resin temperatures for such thermoplastic molding range from about 560-600 °F, and the Bhalakia patent cites a resin temperature of 585 °F in Examples 1-4 and 9 (col. 21, lines 3-4, and col. 24, lines 19-20). Such heat suggested for bonding is far beyond the temperatures associated with the polyurethane cure conditions, which are typically in the range of 65 °F to about 270 °F.

In addition, thermoplastic molding conditions typically involve both heat and high pressure. This is distinct from polyurethane processing, where the reaction occurs at moderate temperature and at atmospheric pressure. Those of ordinary skill in the art would not correlate this polyurethane chemistry with the high temperature and pressure thermoplastic processing described in the Bhalakia patent.

It should, therefore, be appreciated that the Bhalakia and Slagel patents, together, fail to teach those having ordinary skill in the art how to make an optical-quality polarized part

as defined in amended independent claim 1 and its dependent claims 36-38. Accordingly, the rejection of claims 1 and 36-38 under 35 U.S.C. § 103(a), based on the combination of the Bhalakia and Slagel patents, is improper and should be withdrawn.

Conclusion

This application should now be in condition for allowance. Issuance of a Notice of Allowance is respectfully requested. If the Examiner believes that a telephone conference with Applicants' undersigned attorney of record might expedite the prosecution of this application, she is invited to call at the telephone number indicated below.

Date: November 4, 2003

Respectfully submitted,

SHEPPARD, MULLIN, RICHTER & HAMPTON LLP

By: _____

James R. Brueggemann
Registration No. 28,286

333 South Hope Street, 48th Floor
Los Angeles, California 90071
Telephone: (213) 620-1780 x4156
Facsimile: (213) 620-1398